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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,696	08/04/2005	Rene L. Cruz	0321.68263	7642

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EXAMINER	
KASRAIAN, ALLAHYAR	
ART UNIT	PAPER NUMBER
2617	
MAIL DATE	DELIVERY MODE
09/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,696	CRUZ ET AL.	
	Examiner	Art Unit	
	ALLAHYAR KASRAIAN	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17,19-24,26 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-10,12-15,19-21,23,24 and 26* is/are rejected.

7)☐ Claim(s) *5,11,16,17 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/22/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Applicant's claim for domestic priority under 35 U.S.C. 119 and/or 120 is acknowledged.

Preliminary Amendment

2. The present Office Action is based upon the original patent application filed on 02/22/2005 as modified by the preliminary amendment filed on 10/26/2007. **Claims 1-17, 19-24 and 26-27** are now pending in the present application.

Drawings

3. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Specification

4. Amendment to the specification received on 02/22/2005 is acknowledged by the Examiner.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8 and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Consider **claim 8**, the definition of "the vector determines the duty cycle of the transmission modes that are scheduled" is not specifically defined in the specification. Examiner interprets the claim as, "The method of claim 1, wherein said step of determining determines a vector whose dimensionality is equal to the number transmission modes in the subset."

Claim 9 is also rejected by the virtue of their dependency on **claim 8**.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless – (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 1-4 and 15** are rejected under 35 U.S.C. 102(e) as being anticipated by **Attar et al. (US Patent Application Pub. # 20040038697)** (hereinafter Attar).

Consider **claim 1**, Attar discloses a method for scheduling communication in a wireless communications network, the network having a plurality of nodes, the method comprising steps of:

measuring channel parameters between arbitrary nodes in the wireless communications network (FIG. 1 par. 0041 and 0068);

for each possible transmission mode, identifying a signal to interference plus noise ratio based upon the measured channel parameters (par. 0040, consider transmission mode as forward links from different access points);

mapping the signal to interference plus noise ratio into a data rate for the transmission modes (par. 0041, 0043); and

from a subset of transmission modes that result from the step of mapping, determining which of all of the transmission modes are may be scheduled for one of to meet minimum data rate constraints between links and minimize total average power, or to maximize total throughput while meeting a maximum power constraint on each link in the network (par. 0029, 0040, 0043, 0078-0079, 0140, 0169-0172, 0178, the subset of transmission modes could be considered as forward/reverse link from access point 100 or 102 t/from access terminal 104).

Consider **claim 2 as applied to claim 1 above**, Attar discloses step of measuring measures channel parameters between all nodes in the wireless communication network (par. 0039).

Consider **claim 3 as applied to claim 1 above**, Attar discloses said step of measuring

measures channel parameters between a subset of all of the nodes in the communication network, including nodes having no communication link at the time of measuring (par. 0039).

Consider **claim 4 as applied to claim 1 above**, Attar discloses said step of determining comprises: applying a linear program constrained by the minimum data rates between links and the transmitting power of nodes (par. 0041-0043).

Consider **claim 15 as applied to claim 1 above**, Attar discloses carried out by a node in the network (FIG. 1 par. 0029, 0041-0042).

8. **Claim 19** is rejected under 35 U.S.C. 102(e) as being anticipated by **Agee (US Patent Application Pub. # 20040095907)**.

Consider **claim 19**, Agee discloses a method for scheduling communication in a wireless communications network, the network having a plurality of nodes, the method comprising steps of:

measuring channel parameters between arbitrary nodes in the wireless communications network (0071);

determining a set of transmission modes, each transmission mode in specifying a state of operation for links of the network, said step of determining being conducted by minimizing a weighted sum of expended transmission powers across the links of said network in view of the channel parameters measured in said step of measuring, such that each link in the network

achieves a predetermined minimum data rate (abstract, par. 0071, 0138, 0147-0148, 0186).

9. **Claims 20, 21, 23, 24, and 26** are rejected under 35 U.S.C. 102(e) as being anticipated by **Zourntos et al. (US Patent Application Pub. # 20030100343)** (hereinafter Zourntos).

Consider **claim 20**, Zourntos discloses a method for routing information through a wireless communication network, the network having a plurality of nodes and a plurality of potential links between the nodes, the method comprising steps of:

determining a traffic matrix that specifies the rate of information transport between each pair of nodes in the network (par. 0289);

setting an initial routing of traffic on said links of the network in order to support the traffic matrix determined in said step of determining a traffic matrix (FIG. 14, par. 0196-0197);

determining required data rates on the links of the wireless communication network for the initial routing of traffic set in said step of setting (par. 0196-0197, 0289, 0296);

computing a sensitivity of links in response to change of data rate (par. 0293, 0296, 0359);

iteratively adjusting the routing of traffic using the sensitivity of links so that the weighted sum of expended transmission powers across the links of the network is reduced and repeating said steps of determining and computing (par. 0257, 0267, 0414).

Consider **claim 21 as applied to claim 20 above**, Zourntos discloses said step of computing computes a sensitivity parameter for all links in the network (par. 0293, 0296, 0359).

Consider **claim 23 as applied to claim 20 above**, Zourntos discloses said step of computing computes sensitivity for a subset of links in the network (par. 0223, 0293, 0296, 0359).

Consider **claim 24 as applied to claim 20 above**, Zourntos discloses said step of iteratively adjusting and repeating is repeated until the weighted sum of expended transmission powers does not significantly change in response to adjusting the routing (par. 0267, 0414).

Consider **claim 26**, Zourntos discloses a method for scheduling transmission of information through a wireless communication network, the network having a plurality of nodes and a plurality of potential links between the nodes, the method comprising steps of

measuring channel parameters between arbitrary nodes in the wireless communications network (par. 0293);

determining a set of transmission modes for the wireless communication network while accounting for the channel parameters measured in said step of measuring, wherein each transmission mode in the said set specifies a state of operation for the communication links of said network, with the objective of one of minimizing a numerical value determined by power expended on links of the wireless communication network, such that prespecified data rates on links of said network can be achieved by use the set of transmission modes, or maximizing a weighted sum of data rates across the links of said network, and such that the power consumed by each transmitter is no greater than a predetermined maximum value (par. 0257, 0267, 0414).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. **Claims 6-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Attar et al. (US Patent Application Pub. # 20040038697)** (hereinafter Attar) in view of **Agee**

et al. (US Patent Application Pub. #20040095907) (hereinafter Agee).

Consider **claim 6 as applied to claim 1 above**, Attar discloses said step of determining determines the links that define a transmission mode (par. 0040-0041),

However, Attar fails to explicitly disclose the duty cycle for each transmitting node in the transmission mode.

In the same field of endeavor, Agee discloses the duty cycle for each transmitting node in the transmission mode (par. 0259).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate the duty cycle for message transmission and reception of a link as taught by Agee to the links for transmission mode as disclosed by Attar for purpose of lowering the processing imbalance which otherwise might be created between transmission and reception modes.

Consider **claim 7**, Attar as modified by Agee disclose the clamed invention **as applied to claim 6 above**, in addition Attar discloses a transmission mode determined in said step of determining further comprises a transmission power and data rate for each of the links (0041).

Consider **claim 8 as applied to claim 1 above**, Attar discloses the claimed invention except said step of determining determines a vector whose dimensionality is equal to the number transmission modes in the subset, wherein the vector determines the duty cycle of the transmission modes that are scheduled.

In the same field of endeavor, Agee discloses said step of determining determines a vector whose dimensionality is equal to the number transmission modes in the subset, wherein the vector determines the duty cycle of the transmission modes that are scheduled (par. 0192).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate a transmit vector based on a partial linearization of the network quality metrics as taught by Agee to the network disclosed by Attar for purpose of either minimize the total transmit power in the entire network subject to a network quality constraint, preferentially capacity, or maximize network quality, preferentially capacity, subject to a total transmit power constraint.

Consider **claim 9 as applied to claim 8 above**, Agee further discloses a minimum specified data rate on each link is a constraint on the vector that is incorporated in a linear program to minimize the total transmission power (par. 0192 and 0152).

12. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Attar et al. (US Patent Application Pub. # 20040038697)** (hereinafter Attar) in view of **Amadon et al. (US Patent # 7020147)** (hereinafter Amadon).

Consider **claim 10 as applied to claim 1 above**, Attar discloses the claimed invention except said step of determining comprises application of a convex duality calculation.

In the same field of endeavor, Amadon discloses said step of determining comprises application of a convex duality calculation (col. 10, lines 21-33).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate a convex duality theory as taught by Amadon to the network disclosed by Attar for purpose of optimize data packet traffic in a data communication system.

13. **Claims 12-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Attar et al. (US Patent Application Pub. # 20040038697)** (hereinafter Attar) in view of **Ogier (US Patent Application Pub. # 20030095504)**.

Consider **claim 12 as applied to claim 1 above**, Attar discloses the claimed invention except applying in a hierarchal manner and carried out on a cluster of links, further comprising the steps of dividing a set of links into clusters, and carrying out said steps of measuring and determining for each cluster.

In the same field of endeavor, Ogier discloses applying in a hierarchal manner and carried out on a cluster of links, further comprising the steps of dividing a set of links into clusters, and carrying out said steps of measuring and determining for each cluster (Fig. 1 par. 0130, 0191).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate a hierarchical manner and cluster links as taught by Ogier to the network management method disclosed by Attar for purpose of dividing network in hierarchical model.

Consider **claim 13 as applied to claim 6 above**, Ogier discloses inter-cluster interference is modeled as static ambient noise (0004, 0130).

Consider **claim 14 as applied to claim 13 above**, Ogier discloses interaction between clusters is modeled with a fixed-point equation that determines the level of inter-cluster interference (0130).

14. **Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Zourntos et al. (US Patent Application Pub. # 20030100343)** (hereinafter Zourntos) in view of **Agee et al. (US Patent Application Pub. #20040095907)** (hereinafter Agee).

Consider **claim 27 as applied to claim 26 above**, Zourntos discloses the claimed invention except said step of determining includes determining a duty cycle for each transmission mode in the set of transmission modes determined in said step of determining.

In the same field of endeavor, Agee discloses said step of determining includes determining a duty cycle for each transmission mode in the set of transmission modes determined in said step of determining (par. 0259).

Therefore, it would have been obvious to a person of ordinary skills in the art at the time the invention was made to incorporate the duty cycle for message transmission and reception of a link as taught by Agee to the links for network with transmission mode as disclosed by Zourntos for purpose of lowering the processing imbalance which otherwise might be created between transmission and reception modes.

Allowable Subject Matter

15. **Claims 5, 11, 16, 17 and 22** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

a. Ades (U.S. Patent # 7286489) disclose Communications meshes

b. Shattil (U.S. Patent Application Publication # 20080075033) discloses Cooperative beam-forming in wireless networks.

c. Sindhushayana et al. (U.S. Patent Application Publication # 20040202196) disclose Method and apparatus for adaptive rate selection in a communication system.

d. Bellur et al. (U.S. Patent Application Publication # 20030120809) disclose Interference mitigation and adaptive routing in wireless ad-hoc packet-switched networks.

e. Akin et al. (U.S. Patent Application Publication # 20040013101) disclose Method and system for allocating power and scheduling packets in one or more cells of a wireless communication system or network.

f. Larsson et al. (U.S. Patent Application Publication # 20030161268) disclose Cross-layer integrated collision free path routing.

g. Garcia-Luna-Aceves et al. (U.S. Patent Application Publication # 20020049561)

disclose Unified routing scheme for ad-hoc internetworking.

17. Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

18. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Allahyar Kasraian whose telephone number is (571) 270-1772. The Examiner can normally be reached on Monday-Thursday from 8:00 a.m. to 5:00 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Pérez-Gutiérrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-

4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

/Allahyar Kasraian/
Examiner, Art Unit 2617

A.K./ak

/Rafael Pérez-Gutiérrez/
Supervisory Patent Examiner, Art Unit 2617

September 8, 2008